

REMARKS

The application has been reviewed in light of the Office Action dated June 24, 2003. Claims 1-15 are pending and presented for examination with claims 1, 6-8 and 12 being in independent form. Independent claims 8 and 12 have been amended to place the claims in better form for examination.

The abstract of the disclosure was objected to because it purportedly is too long.

In view of the amendment to the abstract hereinabove, withdrawal of the objection is requested.

Claims 1, 3-8, 10-12, 14 and 15 were rejected under 35 U.S.C. § 102(b) as allegedly anticipated by U.S. Patent No. 4,656,318 to Noyes.

Claims 2, 9 and 13 were rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over Noyes in view of U.S. Patent No. 6,445,733 to Zuranski et al.

Applicants have carefully considered the Examiner's comments and the cited art, and respectfully submits that independent claims 1, 6-8 and 12 are patentable over the cited art, for at least the following reasons.

This application relates to facsimile apparatuses and other communication terminals which are connected to an analog communication network and provided with a power management feature. As discussed in the application, such facsimile apparatuses and other communication terminals may be provided with means for electrical isolation between the network and the internal circuitry of the terminal (or apparatus).

In addition, such facsimile apparatuses and other communication terminals may also have power consumption concerns. Power saving features are integrally provided along with electrical isolation

features according to the present application. In particular, according to the apparatuses and methods of the present application, network control and monitor signals are electrically isolated from modulated digital signals, and in a power-saving state, operation of a line interface circuit and a network control signal processing section of a digital signal processing circuit is carried out, while operation of a modulation and demodulation processing section of the digital signal processing circuit is suspended.

For example, independent claim 1 relates to a communication terminal apparatus connected to an analog communication network. The apparatus comprises a line interface circuit, a digital signal processing circuit, a digital interface device and a power-saving control device. The line interface circuit is configured to connect to the analog communication network and to control the network, convert analog data comprising network control and monitor signals and a modulated signal received from the network into digital data, and convert digital data comprising network control and monitor signals and a modulated signal for transmitting to the network into analog data. The digital signal processing circuit is configured to comprise a network control signal processing section that receives network control and monitor signals from the line interface circuit and a modulation and demodulation processing section that receives a modulated digital signal from the line interface circuit and transmits a modulated digital signal to the line interface circuit. The digital interface device is disposed functionally between the line interface circuit and the digital signal processing circuit and is configured to electrically isolate the network control and monitor signals and the modulated digital signals. The power-saving control device is configured to

carry out the operation of the line interface circuit and the network control signal processing section of the digital signal processing circuit and suspend the operation of the modulation and demodulation processing section of the digital signal processing circuit so as to be into a power-saving state when a predetermined power-saving state change factor has occurred in a normal operating state, and resume the suspended operation of the modulation and demodulation processing section of the digital signal processing circuit when an incoming call signal is received by the line interface circuit and processed by the network control signal processing section of the digital signal processing circuit during the power-saving state.

Noyes, as understood by Applicants, is directed to a modem apparatus which is connected to a host computer and configured to have a conventional modem device structure. When the Noyes modem apparatus is employed in (in particular one of the latest models of) a facsimile apparatus, the facsimile apparatus would not work well in many instances such as described below. Since the claimed invention has a structure which is the product of careful consideration given to said instances, it is clear that the present invention is substantially different from Noyes.

In the Noyes modem, the modulation/demodulation circuit, the transmitting/receiving filter, and the telephone line interface are configured with a common power supply system and the entire power for the modem is cut off in a power saving mode. However, the Noyes modem, having this structure, cannot perform detection of a call signal at a sufficient level of accuracy.

While FIG. 2 of Noyes indicates an exemplary circuit for generating a detection signal M<sub>ring</sub>, detection of the call signal needs

to be performed only with passive circuits requiring no power sources and therefore the waveform shaping circuit shown in FIG. 2 has limitations. With such waveform shaping circuit, a pulse-like noise induced from, for example, a commercial power source to the telephone line, may erroneously be detected. This kind of pulse-like noise frequently occurs in the typical telephone line. As a result, the host computer of Noyes frequently would erroneously detect a call signal. Consequently, a time period for energizing the Noyes modem increases, resulting in an insufficient power saving effect.

In contrast, according to the claimed invention, a portion of the digital signal processing ("DSP") circuit (including the network control signal processing section) is operative so as to obtain signal detection accuracy, at a substantially higher level as compared to the Noyes apparatus.

It may be possible to improve the accuracy level of the Noyes apparatus by allowing the host computer to process and evaluate a call signal ("enhanced Noyes"). However, according to such modification of the Noyes apparatus, the function of the modem would be transferred to the host computer, which is contrary to the teachings of Noyes. In addition, the host computer would need to be continuously operative in order to be able to detect, process, and evaluate the call signal. Accordingly, power consumption at the modem side can be decreased but the enhanced Noyes apparatus does not ensure at all reduction of the power consumption of the system including the host computer and the modem.

In contrast, the claimed invention does not transfer a portion of the functions of a modem to a device external to the modem. The claimed invention aims to reduce overall power consumption of the

system including the modem as well as any external device. The claimed invention realizes a sufficiently accurate line interface, including a call signal detection functionality, by processing the line interface signal with a DSP means. The DSP may be a device comprising digital circuits and, through integration via recent LSI manufacturing processes at a microscopic level, can carry out the signal processing at a lower cost, which cannot be achieved even with enhanced Noyes.

Moreover, according to the claimed invention, the DSP portion is isolated from the CPU. In contrast, the modulation/demodulation circuit of Noyes is disposed at the telephone line side.

Applicants can simply find no disclosure or suggestion in Noyes, however, of electrically isolating network control and monitor signals and modulated digital signals, and in a power-saving state carrying out the operation of the line interface circuit and the network control signal processing section of the digital signal processing circuit and suspending the operation of the modulation and demodulation processing section of the digital signal processing circuit, as provided by independent claim 1.

Since Noyes does not disclose or suggest each and every feature of the claimed invention, the reference cannot render unpatentable the claimed invention.

Zuranski, as understood by Applicants, relates to a digital subscriber line communication system. Zuranski was cited in the Office Action as purported disclosing that a modem can be placed into a low power state by reducing or halting clock signals within the modem.

Applicants do not find disclosure or suggestion in the cited art, however, of electrically isolating network control and monitor signals and modulated digital signals, and in a power-saving state carrying out

the operation of the line interface circuit and the network control signal processing section of the digital signal processing circuit and suspending the operation of the modulation and demodulation processing section of the digital signal processing circuit.

Accordingly, for at least the above-stated reasons, Applicants respectfully submit that independent claim 1 is patentable over the cited art. Independent claims 6-8 and 12 are believed to be patentable over the cited art for similar reasons.

The Office is hereby authorized to charge any additional fees that may be required in connection with this amendment and to credit any overpayment to our Deposit Account No. 03-3125.

If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition, and the Commissioner is authorized to charge the requisite fees to our Deposit Account No. 03-3125.

If a telephone interview could advance the prosecution of this application, the Examiner is respectfully requested to call the undersigned attorney.

Entry of this amendment and allowance of this application are respectfully requested.

Respectfully submitted,

  
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